



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

## THE PHILOSOPHY OF NATURE.

(COMMENTARY ON THE FOREGOING ARTICLE.)

The exposition of Aristotle's Philosophy of Nature by Hegel, which is given in this number of the Journal in a stiff and literal translation, will perhaps excite some curiosity as to its standpoint and bearing. Its presuppositions are so different from those current in our day, that we have no expectation that either Aristotle or Hegel will make much impression in this province. In spiritual things—such matters, for instance, as were treated in the exposition of the "Metaphysics" given in our last number—it is fair to suppose that a large number saw, or might have seen, many deep thoughts to repay them for the labor of reading and studying that article. But that there should be any speculative explanation of nature, this does not seem possible to other than the few.

In order, however, that such readers as venture to try Aristotle in this number may have an article close at hand to serve as an antidote to its effects, we offer the following remarks:

I. The common opinion of those who attempt to read Hegel's Nature-Philosophy holds that he attempts to construct or deduce natural things by an *a priori* process, eschewing at the same time all induction. A moment's thought is sufficient to suggest this objection to such a procedure on the part of Hegel: suppose that he does deduce certain thought-determinations from abstract, *a priori* grounds, how can he identify these thought-determinations with natural determinations, so as to know and name what he has deduced? How, for example, when he has deduced the determinations *space*, *time*, or *motion*, does he know that these are properly called space, time, and motion, or that what he thinks under those names is what mankind have thus named? Can he do this without carefully collecting the empirical characteristics of these determinations from the ordinary consciousness, and then identifying them with his *a priori* ones by careful comparison? Of course he cannot: every one sees this at a glance. Supposing, then, that he *can* deduce determinations, there

are two other steps to the process of making a nature-philosophy, making three in all:

1. Deduction of the ideal determination.
2. Induction of the empirical characteristics of natural objects.
3. Identification of the natural object with the ideal determination.\*

Such a process cannot properly be called deduction, for it involves likewise the process of induction, and Hegel must be unconscious of the presuppositions he makes if he professes to follow deduction and eschew induction. Does he profess anything of the kind? The reader of the third volume of his *Logic* does not need be told that Hegel merits almost exclusively among moderns the honor of having pointed out the exact force and relation of these processes, and their union in the total process. (*Werke*, B. V. s. 115-162.) In fact, a proper statement of Hegel's endeavors would be more nearly this: he attempts to comprehend the world of actuality, and to explain all things through it. He has first investigated the validity of all thoughts and ideas (i. e. pure thoughts) in his *Logic*. Then he comes to nature with the insight into the FIRST PRINCIPLE that leads him to look for certain realizations of those pure ideal forms. His great labor, however, lies in critically collecting and sifting the phenomena of nature, for he must correctly classify these phenomena according to the scale of concreteness and abstractness. He has no difficulty in seeing the extremes of contrast: there is the mechanical and the organic in opposition—clearly the organic is more concrete and has more of its phases real at once than the mechanical, which is *real* in only a few of its phases, and merely *potential* in most of them. There comes to view a middle province, that of Physics proper, wherein the abstractness of the mechanical is partly modified by the entrance of a unity, so that the contrasts stand in connection through a middle term; chemistry is the highest type of this middle province. The relation of acid and base realized in a salt is far more concrete than that of Space and Time in Motion; i. e. it includes the latter and many other determinations, while

---

\* The reader will find an able exposition of this subject in Everett's *Science of Thought* (p. 169 *et seq.*), published in Boston by W. V. Spencer.

the latter does not include the former. The chemical relation is a better symbol of the organic than is the mechanical. In the mechanical, the unity is entirely outside or external (e. g. the gravity of a body to another outside of it), and is manifested in it only in external movement. In the physical there is more individuality manifested; the unity is partly internal, inasmuch as the elements in their antithesis exhibit it (the unity) as their essential quality. In the organic the unity becomes completely real; it controls as final cause the determinations which arise.

II. Whatever phenomena appear in nature have to be classified according to their general characteristics. The perception of these general characteristics is a process of identification and not of discovery. Induction is not, as a whole process, the operation it is generally supposed to be by those who talk of it most. It is not a pure passivity of the mind directed to finding simply what is given it from without. The inductive philosopher is engaged in the same threefold process that the speculative philosopher employs in his "nature-philosophy." There is no help for it. He may be unconscious, and perceive only one phase of his process. The ostrich attempts to hide from the hunter by thrusting his head into the sand. The inductive philosopher would escape from the *a priori* phase in his process by ignoring it and looking the other way. But when any very general result is reached, the activity of thought, which identifies the object with its own synthesis, becomes apparent enough. Indeed, to one who reflects on the nature of the syllogism, it is clear that any form of it involves, implicitly or explicitly, the same process, to wit: (1) the seizing and fixing of the empirical object, which involves (2) a classification or a free handling of the object by thought, the analysis and synthesis of ideas, which again involves (3) a process of pure or free thought wherein the genesis of ideas as categories takes place—unconsciously in most cases. Unless the inductive philosopher recognized the general principle, he would have no claim to be called a discoverer. But the activity of the mind is the same whether he defines the principle by limiting the generic term in pure thought, or limiting the same in the presence of the object. The identification must be the same; but the consciousness

of the process may be quite wanting in the one case, and hence the freedom involved in it not realized. The formation of an idea is always a free thought-process: the *maya* of the sense-activity makes us think that we are passive receivers of ideas when we are not such. To the *reality* of freedom must be added its *appearance* also. This is essential to the complete "liberation of the soul," as Kapila calls it.

III. Elsewhere another statement of this point has been made:\*

"Deduction is no more speculative than Induction is. Both are defective, and have this peculiarity in common with all partial procedures: they each involve an unconscious procedure entirely the reverse of the conscious one which is named. How, for example, could one ever deduce anything without recognizing in the product something before familiar to him in some inductive shape or other? Let him follow out the strictest dialectical procedure, and commencing with the ultimate abstraction = Being (if he will); in this, what meaning soever he finds, implies other concepts; and since in the definition of his object he is carried beyond it, he calls this *deduction*; but the 'other concepts' involved in the first had to be identified and named: they had to be defined before he could call his procedure a progress at all. No deduction was possible, therefore, until he identified those concepts that arose to view with familiar names of concepts hitherto known to him empirically. The pure thinker, who saw the dialectical procedure without being able to recognize its results, would never be in a condition to describe it in words. Indeed, the mystics are those who see this movement of pure thought, but are so unacquainted with the scientific vocabulary of their language as not to identify the procedure under the conventional description; they therefore use concrete, sensuous expressions having analogies to the content they attempt to utter. In mystic philosophy, for this very reason, dependence upon the inductive factor is most apparent.

"Not less, however, is Deduction an unconscious factor in all Induction. The inductive process could never take the first step above the concrete material before it, except by the free process known in pure thought. Classification—indis-

pensable to Induction—not only precedes generalization, but is the result of generalization. The act of induction seized as a whole is as creative as that of deduction. The inductive philosopher who knows nothing of the pure thought-movement by itself, is at all times half unconscious of his entire activity. With this unconsciousness comes the danger of mistaking one-sided abstractions for concrete laws. The speculative cognition contains both phases—the deductive and inductive; but not as distinct processes. The syllogism in which the Particular, the Individual, and the Universal, are—not successively, but simultaneously—the middle term, is no longer a mere syllogism, but is the form of ‘knowing by wholes’ of which Plato speaks.”

Thus it is clear that the empirical element or phase enters even into Ontology, and that what consciousness has unconsciously produced (absurd as this may sound) through its own development is consciously developed and recognized in the science of Pure Thought.

IV. The reader may be interested to compare Hegel’s arrangement of the details of Nature-Philosophy with that of Aristotle. In Hegel’s Philosophy of Nature (Vol. II. of the *Encyclopædia*, 2d ed.) the subjects discussed are given in the following order:

#### I.—MECHANICS.

##### CHAPTER I.: MATHEMATICAL MECHANICS.

- A. Space.
- B. Time
- C. Unity of Time and Space: motion and matter.

##### CHAPTER II.: FINITE MECHANICS; GRAVITY.

- A. Inertia.
- B. External Impulse (*Stoss*).
- C. Gravity.

##### CHAPTER III.: ASTRONOMY.

- A. Universal Gravitation.
- B. The Kepplerian Laws.
- C. The Totality of the Solar System.

#### II.—PHYSICS.

##### CHAPTER I.: PHYSICS OF GENERAL INDIVIDUALITY.

- A. The Free Physical Bodies (Sun, Planets, Moon, and Comets).

B. The Elements (Air, Fire, Water, and Earth).

C. Meteorology.

CHAPTER II.: PHYSICS OF PARTICULAR INDIVIDUALITY.

A. Specific Gravity.

B. Cohesion (Adhesion, Coherence, Elasticity).

C. Sound.

D. Heat.

CHAPTER III.: PHYSICS OF TOTAL INDIVIDUALITY.

A. Shape (Magnetism, &c.)

B. Particular Properties of Bodies.

1. Relation to Light—Transparency, Refraction, Science of Colors.

2. Properties of the Antithesis—Smell and Taste.

3. Electricity.

C. Chemical Process (Galvanism, Salt-formation, Elective Affinity).

III.—ORGANICS.

CHAPTER I.: THE EARTH-ORGANISM.

A. History of the Earth.

B. Geology and Oryktognosy.

C. The Life of the Earth (Atmosphere, Sea, Land).

CHAPTER II.: THE PLANT.

A. Shaping-process (leaf and root, cell-structure, movement of the sap, &c.)

B. Process of Assimilation (with light, air, and water).

C. Sexual Process.

CHAPTER III.: THE ANIMAL.

A. Formation.

1. Function of Organism.

2. Systems of Formation (a. Nerve-system, including also the Osseous; b. Blood-system, including the Muscular, the Lungs and Liver, the Heart; c. The Digestive-system).

B. Assimilation.

1. Theoretical Process.

2. Practical Process (a. with light; b. breathing, perspiration, thirst; c. digestion).

3. Instinct.

C. Sexual Process.

1. Sexual relation.

2. Zoölogy (a. Worms and Mollusks; b. Insects; c. Vertebrates—fishes, amphibia, birds, mammals).

3. Medicine (a. Nosology; b. Therapy; c. Death of the individual).

Under the last topic (Death of the individual) is given briefly Hegel's doctrine of the nature of physical death, and the compass of its effects. Its connection with the diremption of sex excludes it from the life of the mind, and hence conscious being is immortal. The neglect of careful study of this last chapter of the *Philosophy of Nature*, and the transition contained therein to the *Philosophy of Mind*, has led to much misapprehension of Hegel's doctrine on this point. It is not Hegel's fault, however. (On the top of page 107, Vol. IV., *Jour. Spec. Phil.*, we state briefly this doctrine of Hegel as we have seen it by the aid of Hegel's remarks in the chapter before mentioned.)

V. The crusade against technical words continues still. People are frequently saying: "If you would only give your thoughts in common language, it would be so much easier to understand you." With all seriousness, these people are radically mistaken. If speculative thoughts were crowded into "common language," they would of course appear like common thoughts, if the expression means anything. For what is wanted is, easily comprehended thoughts. Now, suppose a deep and true thought were so expressed, in common language, as to seem a trite remark or a truism: common-place thinkers would slide over it smoothly, and see no deep thought at all; while a few deep thinkers, on the alert, might catch the subtle under-meaning. If, on the contrary, the thought preserves a technical expression, the easy, common-place thinker receives a severe shock when he comes upon it, and is not left in a state of doubt whether he understands it or not. He sees at once that he does not "make sense" of it. If he is simple and sincere, and withal possessed of humility, he will summon his powers, and, by hard thinking, master the passage. He will be rewarded by the consciousness of added power which increased insight gives. But if he is conceited and vain, it is likely that he will accuse the author of obscurity and confusion of thoughts.

These remarks find their illustration in translations of Aristotle. In some cases the translators have worked with the assurance that what they could not readily understand, with their limited culture of thought, was due to some clumsiness of Aristotle in expressing himself, or else to the fact



that "here, the text is very corrupt." They have accordingly taken the liberty to translate freely, into "good, easy English," whatever they have undertaken. The consequence is that the reader finds in their translations nothing deep, nothing new; and he goes on from page to page, wondering why Aristotle has been called the profoundest of philosophers—"the father of those that know"—and is tempted to think that what was great for the heathen Greeks, and the semi-civilized people of the dark ages, is very trite and trivial for men in this "enlightened age." The effect of such self-gratulation is indeed pitiable. Growth can be expected only from the conjunction in the mind of profound humiliation and most intense aspiration. The scholar should gird himself for work anew after each successfully completed labor, just as if he had to climb the new ascent from the base; he must begin as if he knew nothing, and had all to learn. In this way he moves on solidly, and is not hampered by presuppositions.

This frame of mind is above all necessary in the study of Nature. The trouble lies mainly in the fact that people too readily swallow certain labelled results, without independent examination of their grounds. These labels are in very frequent use. "The cause of this is electricity," says the professor. Everybody understands what is meant by the predicate, "electricity," does he? It is worse with such predicates as *gravity*, *cohesion*, *affinity*, *light*, *heat*, *motion*, etc. These labels are wrapped around certain syntheses of natural phases, and the whole is then used as if it were a simple, well-known object. The consequence is that self-deception prevails generally among those who write or talk on these themes. If these labels or technical terms are used with anything like an adequate sense of their meaning—i. e. of the phases and relations synthetically united under these technical terms—common-place readers get shocked in the way we have described.

Accuracy is indispensable; the precision must be infinite; definitions must therefore be exhaustive. The strength of mind is tried by this closeness of defining. To adapt a scientific work to popular (i. e. common-place or weak and undeveloped) minds, it is, therefore, requisite to leave out

definitions, or at least to relax their severity. This process at once takes away the very thing which forms the end and aim of the study proposed. What we wish to do is to bring up the mind to that strength of grasp that enables it to deal with the wide syntheses in a competent manner; not to drag down and mince up the object to fit it for the narrow and undeveloped intellect.

VI. Of the discussions in the article of Hegel on Aristotle's Philosophy of Nature, the most important is that of the ideas of Necessity and Adaptation—or *causæ efficientes* as opposed to *causæ finales*. This distinction is a vital one; and the thinker who cannot transcend the category of efficient cause, and find it to be conditioned on a deeper principle—that of “sufficient reason,” or final cause—has by no means arrived at speculative thinking. Through this insight one arrives at the doctrine of the *causa sui* (self-mover) and of freedom; all on the hither side is necessity and fatalism.

The discussions of time, space and motion, as ideal and as real processes, together with the limitation of bodies and places, as explained through them, are of the highest philosophical interest; and one will find in Hegel's *Natur-Philosophie* a fuller exposition of the same determinations.

The categories of Potentiality and Actuality, as used by Aristotle, have deep significance; this is more apparent in the Philosophy of Nature, where so much is only potential.

The doctrine of the four elements—earth, air, fire and water—seems grotesque enough, especially in the light of our modern chemical discoveries regarding the sixty simple elements. But with the advance of our studies in meteorology, it is not certain that the doctrine of the four elements may not come again into favor at no distant day. At least a hint of a deeper meaning in that old doctrine could be found in considering the four elements to be the solid, the liquid, the gaseous fluid, the ether, instead of definite natural elements.

The advance of studies in biology will gradually bring our physicists back to *final causes*, and then the Philosophy of Nature and that of Mind will harmonize.